

8. (Amended) A magnetic storage apparatus, comprising a magnetic recording medium that in the magnetic recording medium having a magnetic film on a non-magnetic substrate by intercalating at least an under layer, a proportion of functional groups per 100 carbon atoms in a diamond-like carbon protective coating mainly composed of carbon and includes at least one of the -COOH, -C=O, and -CNH<sub>2</sub> as the functional group, for protecting the magnetic film exceeds 20%, and a lubricating film of perfluoroether having at least one functional group provided on the protective coating,  
a driving part for driving the magnetic recording medium,  
a magnetic head having a recording part and a reproducing part,  
a recovery reproducing signal processing part for giving and receiving a signal to and from the magnetic head, and a magnetoresistive head as the reproducing part of the magnetic head.

Please add new claims 9-11 as follows:

9. (NEW) A magnetic recording medium, characterized in that in the magnetic recording medium having a magnetic film on a non-magnetic substrate by intercalating at least an under layer, the proportion of functional groups per 100 carbon atoms in a diamond-like carbon protective coating mainly composed of carbon and included -COOH, -C=O, -COH, and -CNH<sub>2</sub> as the functional group, for protecting the magnetic film exceeds 20%.

10. (NEW) The magnetic recording medium according to claim 9, wherein a lubricating film of perfluoroether having at least one functional group is provided on the protective coating.

11. (NEW) A magnetic storage apparatus, comprising a magnetic recording medium that in the magnetic recording medium having a magnetic film on a non-magnetic substrate by intercalating at least an under layer, a proportion of functional groups per 100 carbon atoms in a diamond-like carbon protective coating mainly composed of carbon and included -COOH, -C=O, -COH, and -CNH<sub>2</sub> as the functional group, for protecting the magnetic film